of the intellectual world passed to Europe mainly by means of material translated into Latin from Arabic, often through Hebrew. This material had itself been largely translated from Syriac, and the Syriac versions themselves were derived from Greek, so that Greek learning reached the West at third or fourth hand. But between the eighth and the thirteenth centuries science and learning, literature and culture remained, like civil organisation and military power, mainly with the Arabic-speaking peoples who stretched from India and Persia to the Atlantic seaboard. The learning of this period is described as "Arabian," and must be carefully distinguished from the true "Arab" material which comes only from Arabia.

It is certain medical aspects of this great Arabian civilisation with which Prof. Browne here deals. It is a subject with a vast literature that can scarcely be treated, even in outline, in a hundred and thirty pages. Apart from the actual changes which the medical system of Greece underwent in Arabian hands, and besides the actual contributions of Arabian authors themselves, an adequate history of Islamic medicine would need to treat of the psychological basis of those changes arising in part from the social and political circumstances of the time, in part from the racial characteristics of the Islamic peoples, and in part from the philosophy and general outlook prevalent among them.

The time is still distant when it will be possible to do this, and Prof. Browne, in this admirable little book, has essayed a smaller task. He concentrates on the work of a small number of the most important Arabian physicians, and notably on three Persians, known to the medieval Latins under the names of Rhazes, Haly Abbas, and Avicenna, whose works were the main carriers of the Arabian medical traditions to the West. Avicenna's enormous "Canon" is especially of importance as being—perhaps with the exception of the "Aphorisms" of Hippocrates—the most widely read work on medicine that has ever been written. More interesting perhaps to most readers will be Rhazes, whose memorable treatise on smallpox and measles was the first in which these diseases were differentiated. This work was translated by the late Dr. Greenhill in 1848, but, with that exception, Prof. Browne's is, so far as we know, the only modern book on Arabian medicine in the English language based on first-hand knowledge. It will be valued both on that account and as a very lucid and scientific exposition of a subject which very few besides Prof. Browne himself are qualified to treat.

Charles Singer.

Elementary Meteorology.

(1) *The Rainfall of the British Isles.* By M. de Carle S. Salter. Pp. xiii + 295. (London: University of London Press, Ltd., 1921.) 8*s.* 6*d.* net.

(2) *Études Elémentaires de Météorologie Pratique.* By Albert Baldit. Pp. ix + 347. (Paris: Gauthier-Villars et Cie, 1921.) 15 francs net.

(3) *Simple Lessons on the Weather for School Use and General Reading.* By E. Stenhouse. Pp. viii + 135 + 12 plates. (London: Methuen and Co., Ltd., 1921.) 4*s.*

(4) *Handbook of Meteorology: A Manual for Co-operative Observers and Students.* By J. W. Redway. Pp. v + 294. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1921.) 24*s.* net.

(1) IN "The Rainfall of the British Isles" Mr. Salter gives a wealth of information that hitherto could be obtained only by searching through the volumes of "British Rainfall." The present work should therefore appeal to the large public which takes an interest in rainfall, and as some 5000 observers read their gauges daily it will be realised how large that public is. Almost every observer would benefit by a perusal of this work, where he will find a discussion of the problems which he himself is assisting to solve. He will find an account of the various types of gauge, and that some, still in use and still sold by instrument makers, are untrustworthy. He will find the exposure of gauges discussed, and he may improve that of his own. He will learn how the data he supplies are used, and find maps illustrating various types of rain, some almost wholly influenced by orographical features, some by the passage of depressions, and others due to thunderstorms.

The discussion of seasonal variation and annual fluctuation will be read with much interest at the present time. Numerous maps are a great feature of the book, and are most instructive; any one who thinks that his own gauge is worth keeping should study the map of the thunderstorm rain in London on June 16, 1917, and note that there was no rain at the Oval, more than 4½ in. at Kensington, while one end of the Serpentine received less than 1 in. and the other more than 3 in.

The rain over the British Isles seems to fall into a watertight compartment; it is perhaps captious to complain that a book on our own rainfall does not discuss the rainfall of the Continent, but it would be of much interest to know how our rainfall links up with that on the other side of the Channel. Possibly the very excellence of the work of the British Rainfall Organization under Dr. Symons, Dr. Mill, and Mr. Salter himself, has made our own information so adequate that it

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cannot be compared in full detail with that of neighbouring countries.

There are one or two slips; for example, "right hand rear section" on page 179 should be "right hand front section." The diagram in Fig. 2 is not sufficiently explained to be intelligible to those readers who are not already familiar with the theories of Prof. Bjerknes. The glossary at the end is not very full: we look in vain, for example, for orographical rain and for convection. The book fills a gap in meteorological literature, and the concluding chapter on the economic application of rainfall data is an indication of how widely it should be studied, not only by meteorologists, but also by those outside their ranks.

(2) "Etudes élémentaires de Météorologie pratique" describes the ideal arrangement of stations for a meteorological service, the instruments used, including captive balloons, pilot balloons, and aeroplanes, and the general procedure of such stations. Part 2 is devoted to problems of pressure and wind, and part 3 discusses forecasting. Squalls and thunderstorms come in for full treatment, and also the sudden clearings of the sky, "éclaircies"; the author's experience as chief of the meteorological service of the Armies of the Centre probably led him to study this phenomenon, so important for aviation and hitherto much neglected. The author advocates numerous observation posts, so that a line squall, for instance, may not pass unnoticed between the regular stations of the service. If such a system had been adopted in this country during the war much serious damage might have been avoided at aerodromes in the South of England. The work does not pretend to be a meteorological handbook, but it is valuable for those engaged in official meteorological work, and it discusses interesting points, some of which may still be rather controversial. The chief fault of the work, if fault it be, is that it is unnecessarily full, which would have made an index all the more useful.

(3) Mr. Stenhouse's little book is intended for school students and for the general reader. The subject, including something of dynamic meteorology, is shortly and clearly explained. But there are a number of inaccuracies which ought to be corrected if the work runs into further editions. The coldest time of day is not a little after midnight but a little before sunrise; strato-cumulus is scarcely a combination of stratus and cumulus, nor is cumulus the typical cloud of the middle layer. Alto-cumulus is not even mentioned; and the distinction between cloud sheets and clouds of convection is not brought out. There are some good photographs, but they have not been well selected; snow and frost scenes do not teach anything in particular, and a more typical selection of cloud forms should have been given; the clouds in Plate VI., though given as cumulus, are nothing of the kind; the top picture in Plate VII. has been inverted. The diagrams of sections across weather maps make a misleading use of the term pressure-gradient. In spite of faults, however, the book forms an attractive introduction to meteorology for beginners.

(4) Unfortunately this cannot be said for Mr. Redway's "Handbook of Meteorology," which contains many inaccurate statements. Hydrogen, on account of its lightness, is stated to be thrown off into space by the rapid movement of the earth; air currents "are deflected by the rotation of the earth on its axis easterly in tropical latitudes, and westward beyond the tropics"; the isothermal layer separates the stratosphere and the troposphere; the stratosphere is stated to be radioactive, indicating the presence of electrified dust particles, and the reason why cloud particles remain suspended is stated to be unknown, and electrification is suggested as a possible explanation; these are only a few of the surprising statements to be found in this work.

C. J. P. Cave.

Freshwater Ciliate Infusoria and Heliozoa.

(1) *Etudes sur les Infusoires d'Eau douce.* By Dr. E. Penard. Pp. 331. (Genève: Georg et Cie, 1922.)

(2) *The British Freshwater Rhizopoda and Heliozoa.* By J. Cash and G. H. Wailes. Assisted by J. Hopkinson. Vol. 5. *Heliozoa.* By G. H. Wailes. Pp. vi+72+11 plates. (London: for the Ray Society, 1921.)

(1) THERE is probably no large sheet of fresh water that has been so thoroughly investigated, so far as its fauna of protozoa is concerned, as the Lake of Geneva. Forel, Jean Roux, Penard, and others have shown its richness in variety of form, in the number of species, in cases of parasitism, and in adaptations to other special habits of life. They have set an example which we might well follow in regard to our English lakes, about which we still know so little.

Dr. Penard has already published massive volumes on the Rhizopoda, the Heliozoa, and the Acinetaria of the lake and neighbouring waters, and the present volume on the ciliate Infusoria, not restricted in this case to protozoa of the immediate locality, is no less imposing than the others.

Dr. Penard's work will doubtless meet with a great deal of severe criticism, because his histological methods are primitive and inefficient, his illustrations badly drawn and abominably reproduced, and the arrangement of the text is most inconvenient for the reader. But he disarms criticism, to some extent, as regards the first defect by his frank admission that all his observa-

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